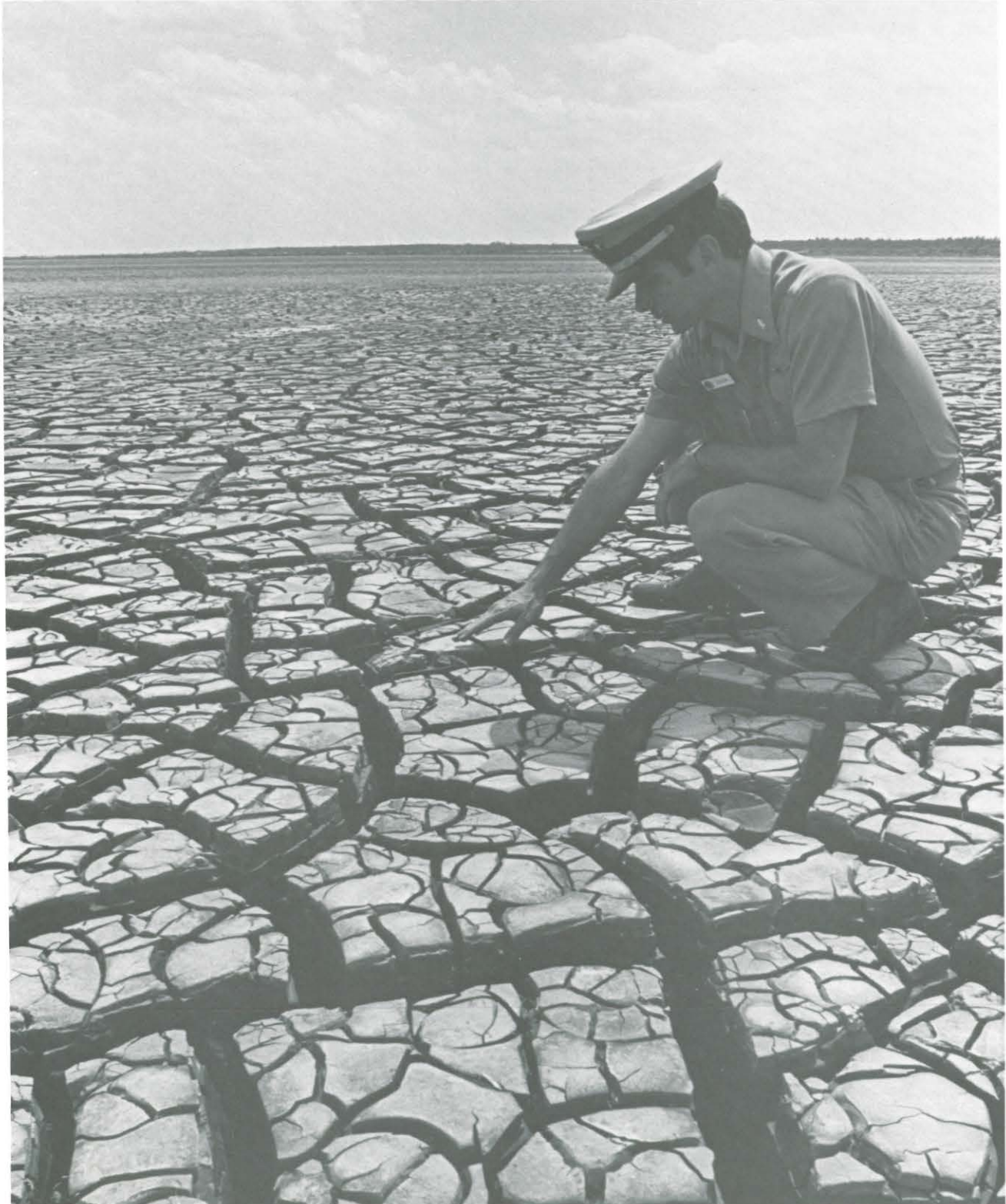


# U.S. NAVY MEDICINE

August 1982



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**COVER:** At first glance, dredge spoil at the Naval Submarine Support Base, Kings Bay, GA, seems an attractive mosaic. But deep within the sun-dried cracks, stagnant water offers the breeding environment for millions of mosquitoes. Finding ways of controlling these insects is just one concern of the Navy Disease Vector Ecology and Control Center, Jacksonville, FL. Story on page 2. Photo by the Editor.



# War Against Malaria

As history shows, malaria and other tropical diseases have often generated more casualties among military people than those incurred on the battlefield. It comes as no surprise then, that malaria control is one of the prime concerns of the Occupational and Preventive Medicine Service in Subic Bay. The disease, which is endemic to the area, must be carefully monitored and studied to prevent a rampant outbreak among the population.

LT Lynn DuBose, MSC, USNR, staff entomologist, has the responsibility for preventing and controlling malaria. He is one of 25 entomologists currently on active duty with the Navy and holds a master's degree in medical entomology from the University of Florida. "The purpose of our program," explains DuBose, "is to reduce the incidence of malaria among Marines training in surrounding areas."

Twice a week DuBose and members of the Preventive Medicine Service

venture across the bay to the shores of Red and Green Beach. Agusuhin, a village at Green Beach, has a population of approximately 350 Filipinos. It is also one of the sites used by the Marines for training operations and must be tested frequently for density of the mosquito population.

HM2 Sharon O'Leary, a preventive medicine technician, explains how this is done. "Mosquito larvae, which thrive in slow-running, clear water, engage in four stages of development and must be obtained and recorded according to number and size of growth. Each stream has designated dipping stations, and we take 10 random samples of water from each station. Then we screen it for the presence of larvae. From there we transfer the larvae into vials and they're taken to the clinic and mounted for further study."

Occasionally, Marine operations are also held at the village of Kina Buksan, a fishing community of 250 people on Red Beach. The same procedures are followed here to obtain larvae samples, but the dipping is a bit more difficult. To obtain samples, the PMS team must follow a stream which leads more than 2 miles up into the mountains, over rough and rocky terrain.

According to DuBose, cooler weather generally shows a reduced incidence of malaria and larvae infestation in these areas. "Increased heat and humidity promote faster growth of the larvae," he said, "and contribute to more widespread transmission of the disease."

The program doesn't stop with testing the water. "If a large number of cases turn up or a large amount of larvae are found," says DuBose, "then malarial smears are performed." This involves taking blood samples from the residents of areas known to have a higher incidence of the disease. The



*LT DuBose checks water for mosquito larvae.*



*HM1 Jaime Buyayo obtains water samples for study.*

areas are also sprayed at night with special insecticides to reduce the number of adult mosquitoes and larvae.

These villages are only two of the many areas served by the members of the preventive medicine staff. They also visit surrounding Negrito villages and other localities where there are cases of malaria.

Though "bug chasing" has its drawbacks, it is a very necessary function if the disease is to be properly studied. LT DuBose notes that "though it is not yet possible to completely eradicate malaria, through our efforts we've managed to reduce the incidence of the disease in both active duty personnel and local community members alike."

—Story and photos by HM2 Mary Drake □

# *U.S. Navy Medicine Visits Disease Vector Ecology and Control Center, JAX*

A pestiferous swarm of ravenous mosquitoes settled on our clothing and skin—one, three, six, twenty. Suddenly there were too many to count. I could feel the uneasiness taking hold as the little vampires began tanking up on my blood supply.

My companion, LCDR Herb Bolton, MSC, seemed unconcerned as he methodically counted our attackers as they lighted. "A landing count can give us a pretty good idea of what we're dealing with," he insisted. I already knew what I was dealing with and retreated to the car, rolled up the windows, and began nursing the angry, red welts that began erupting all over my body.

LCDR Bolton, entomologist, was obviously more comfortable with the subjects of his profession as he attempted to demonstrate a mosquito survey. Bolton is Professional Assistant at the Disease Vector Ecology and Control Center (DVECC) based in Jacksonville, FL. Earlier that morning we had gone below decks of the submarine tender USS *Simon Lake* berthed at the Naval Submarine Support Base, Kings Bay, GA. After a thorough pest survey of the galley, messing areas, and the ship's dry stores, he and two of his colleagues gave the ship a clean bill of health. *Simon Lake's* medical and supply departments were glad to see the DVECC shipboard pest management

team. They had a good pest control program and were proud of the progress that had been made since the last visit.

The mosquitoes that had caused my retreat to the car that afternoon seemed to pose a greater problem. Kings Bay, the Navy's newest submarine support base, was literally being hacked out of the lowland, coastal pine forest, a region replete with stagnant pools and tidal marshes. Artificial ponds created from dredge runoff, the so-called spoil areas, offered additional breeding grounds.

In the early stages of construction, work at the base had to be suspended until the pest population was reduced. Keeping it under control now requires constant vigilance. This increased attention translates into regular mosquito surveys in which traps are monitored and stagnant pools and roadside ditches dipped for larvae. These surveys are a prerequisite for effective insecticide spraying.

Kings Bay now has its own pest control facility and a designated environmental health officer assigned to the base medical department.

What I was witnessing were just some of the services DVECC regularly provides the fleet and shore-based installations. Before my visit ended I learned how this unique facility conducts its mission of providing pest management support to the Navy and

Marine Corps in a manner which protects health, maintains morale and efficiency, prevents property loss, and preserves environmental quality. To accomplish this complex mission, the Center provides technical consultative services, trains both military and civilian DOD employees in pest management and vector control, evaluates and tests equipment, and evaluates pesticides and their impact on the environment.

DVECC is recognized internationally for its achievements. Representatives from the World Health Organization and individual foreign nations frequently visit and confer with the Center's experts on their own unique public health problems.

This is all quite a responsibility, especially for a facility staffed by five officers, six enlisted, and five civilians, and whose "territory" includes the Eastern United States as far as the west border of Texas, the Caribbean\* and Mediterranean, Europe, the Near East, and Africa. Its sister Center, at Alameda, CA, has jurisdiction over the rest of the world.

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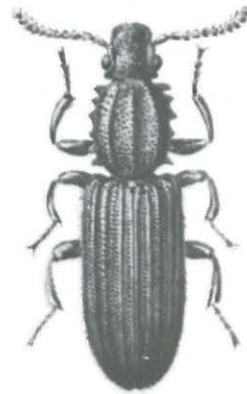
\*After Hurricane David swept through the Caribbean in 1979, DVECC provided on-site assistance to stricken areas in the Dominican Republic. For its participation, the facility received the Meritorious Unit Commendation.





Photos by the Editor

*HMC Sherman Bonomelli (left) and LTJG Joe Conlon survey dry stores aboard USS Simon Lake . . .*



*. . . Looking for insects like the saw-toothed grain beetle.*



*If cockroaches are present the insecticide d-Phenothrin will flush the insects from their hiding places and kill them.*



*LT Richard Williams, MSC (left), environmental health officer at Naval Submarine Support Base, Kings Bay, GA, and LCDR Bolton inspect a light trap. Mosquitoes are attracted with an electric bulb, drawn into the trap by a fan, and killed. The trap's contents will help determine number and variety of insects present in the vicinity.*



DVECC comes under the command and support of the Navy Environmental Health Center, Norfolk, VA, and is presently commanded by CDR Jay M. Lamdin, Officer in Charge. Historically, DVECC is just 33 years old, an outgrowth of one of the remaining malaria control units that survived World War II. Controlling disease vectors and economic pests in support of the operating forces is still one of its key roles.

DVECC's headquarters at NAS Jacksonville is a modern, one-story, 17,000-square-foot facility. The building contains administrative offices; classroom space; a laboratory

equipped to carry on the most advanced entomological investigations; an insectary, where many species are raised and studied; and the Operations Department, containing secure facilities for storing and handling insecticides. There is also a shop where technicians maintain and test equipment.

Administratively, the Center is divided into four Services: Command Support; Operations; Training; and Testing and Evaluation. The Command Support Service provides the overall command and administrative management support to the Center.

## Operations Service

In the United States, where diseases like malaria, encephalitis, dengue, and yellow fever are no longer common, many people tend to perceive flies, mosquitoes, and other insects as summer nuisances. Elsewhere, such diseases are endemic, vectored from one human to another by these same insects we call pests. In a military context, vector-borne diseases can critically affect fighting strength and efficiency. There is an alarming resurgence in vector-borne disease problems throughout the world, and our deployed forces may increasingly be threatened by malaria, dengue,



*Back at the Center, HMC Bonomelli examines a light trap's catch.*



*HM3 Claudia Abromeit conducts a residual insecticide test on cockroaches. The steel plates, simulating bulkhead material, have been sprayed with insecticide, then washed and aged. The speed at which the insects succumb will indicate the insecticide's staying power.*



*Frank Ulmer waves a slide through the output cloud of an ultra low volume insecticide dispersal unit.*



*Microscopic examination of the slide will determine if droplet size and concentration meet insecticide label requirements.*

leishmaniasis, Rift Valley Fever, and others.

DVECC's Operations Service is directly involved with vector surveillance and control. Its teams go on-site demonstrating survey and safe insecticide dispersal techniques to insure that the environment is not unduly contaminated. Personnel stress equipment maintenance and the Center actually provides repair service on-site or back in Jacksonville. As an augment unit of the Mobile Medical Augmentation Readiness Team (MMART), Operations also maintains an emergency vector surveillance and control service 24 hours a day for disaster relief such as was deployed during the 1979 Hurricane David disaster. This assistance is also available to augment the Fleet Marine Force when operations are to take place in areas where vector-borne diseases are endemic.

One of the Operations Service's biggest responsibilities is assisting both fleet and shore commands with their pest management programs. In the course of a year, DVECC teams

may visit up to 100 ships to survey for cockroaches and stored product pests. In most cases, the visits are conducted on a regular rotational basis or requested by the vessels' medical departments.

Once aboard, the DVECC team thoroughly surveys galleys, dining facilities, and food storage areas. If necessary, they will dispense insecticide during the survey and give tips to the medical and supply departments to help solve the ship's pest problems. These assistance visits are informal and DVECC teams find cooperation forthcoming.

Identification of pests and disease vectors is another service provided by Operations. A preventive medicine corpsman at a remote duty station might turn up an insect during a survey that cannot be readily identified. He can prepare the specimen, ship it to DVECC, and have the trained staff identify it for him. Over 5,000 such identifications are made a year.

It is not uncommon for insects to become resistant to frequently used insecticides. A case in point is the ubiquitous German cockroach, one species the Operations Service regularly tests for resistance. Although not definitively implicated as disease vectors, cockroaches in large numbers can seriously affect morale, especially in the close confines of a ship. Their ability to reproduce in such an environment is sobering. Only vigilance in maintaining a clean ship and judiciously applying the proper insecticide will keep the vessel free of infestation.

### **Training Service**

As a certified DOD training facility, DVECC offers a series of basic, advanced, and refresher courses that are as intensive as one might find at a small university. Three courses totaling 4 weeks in Pest Management Technology are conducted for pest control personnel, mainly DOD civilian employees.

There are several 2-week introductory courses in Medical





*Reserve students learn to identify specimens in the DVECC lab . . .*

Entomology and Pest Management Technology for reservists. Continuing medical education credits are available to certain specialties upon course completion.

The Operational Entomology Training course offers advanced training in applied vector-borne disease control required in operational entomology support of disaster relief, combat, and other contingency operations. Participants study malaria, encephalitis, yellow fever, dengue fever, and relate what they learn to solving hypothetical contingency problems. To further challenge the students, instructors have developed a computer model for malaria. The scenario presents a fixed population and a fixed budget and allows the students to build hospitals, use chemoprophylaxis, or devise any means necessary to control a malaria epidemic. The only proviso is that they stay within the budget.

In the lab the students learn to identify 60 different species of disease vectors and economic pests.

A 1½-day class for personnel in shipboard pest management certifies

participants as shipboard pest control applicators.

Almost everyone on the DVECC staff is involved in teaching. The entomologists and the enlisted preventive medicine technicians teach their specialties, and those with years of experience in designing, using, and maintaining equipment pass on their expertise.

### **Testing and Evaluation Service**

Since 1949 the Center has been a pioneer in pest and vector control technology. This includes insecticides, dispersing equipment, and insect research. In 1953 scientists and technicians developed rotary brush pesticide dispensing systems for fixed-wing aircraft. Two years later the Center began insecticide resistance studies for naval activities and initiated investigation of adult mosquito light traps. In 1959 it developed the HIDAL (Helicopter Insecticide Dispersal Apparatus, Liquid), and 3 years later, designed high performance dispersal units for fixed-wing aircraft. With the advent of

Photo by LCDR Herb Bolton



*. . . and dip for larvae in the field.*



*Mosquito larvae appear as tiny rods in the dipper bowl.*

ULV (Ultra Low Volume)\* dispersal equipment, DVECC adapted it for helicopter use in 1965. In 1972 the Center began its ULV droplet slide reading and calibration service for DOD activities. In 1975 it outlined the military acceptance testing requirements for pesticide dispersal units for use by the Armed Forces. Just 3 years ago DVECC formally began evaluating new ULV ground equipment for the Armed Forces Pest Management Board.

As for other pest control hardware, the Center takes standard off-the-shelf items, subjects them to rigid testing, and then makes recommendations to DOD as to whether they are suitable for military use. Such items include everything from battery-powered backpack dispersal units for liquid and powder insecticides to large ULV truck-mounted dispersal machinery.

The Center's ULV droplet slide reading and calibration service is unique. For ULV dispersal units to work efficiently, the discharge droplet size must be the right diameter (measured in microns). Too large a droplet will cause spotting of car finishes, too small a droplet and the insecticide will blow away or be ineffective.

To take advantage of the service, a DOD activity simply has to wave a microscope slide through the discharge cloud of its ULV unit and then send the slide to DVECC. There it is examined under a microscope and recommendations are then made as to whether the equipment requires adjustment or repair.

Providing support to the Marine Corps means testing aerial spray and man-transportable backpack dispersal units. It also means cooperating with other Government agencies such as the U.S. Department of Agriculture's Man and Animals Laboratory in Gainesville, FL, on an insecticide-

impregnated camouflage material that can be used in uniforms, and a mosquito-repellent jacket developed at Camp Lejeune. Such items have been subjected to intensive testing with promising results.

Cooperation with the Army Reserve has provided an opportunity to study a real situation that might be encountered by the Marines in the field. DVECC recently surveyed and then aerially sprayed a portion of an 85,000-acre Florida woodland bivouac site used by Army reservists. The Camp Blanding experience was mutually beneficial. Supervised Navy Reserve students received valuable field experience by conducting the survey, and the site was then sprayed by helicopter, allowing DVECC to maintain the operational readiness of its aerial dispersal equipment. The Army reservists who later tramped through Camp Blanding's marshy undergrowth on maneuvers and bivouacked on its sandy, pine forest floor at night remained relatively tick- and mosquito-free. Thanks to DVECC few found it necessary to wish for the dubious shelter of a tightly sealed automobile. —JKH



*LCDR Bolton reconnoiters Camp Blanding from an Army National Guard helicopter.*

Photo by CDR Jay Lamdin



*LTJG Conlon inspects aerial dispersal equipment prior to helicopter spraying mission.*

\*Ultra Low Volume equipment, the state of the art in insecticide dispersal, more effectively disperses small quantities of insecticide (ounces per acre) than the high volume foggers (pints per acre) of years past.



# CAPT Paul D. Nelson, MSC Director Retires . . .

*On 31 July 1982 CAPT Paul D. Nelson, seventh Chief of the Medical Service Corps, retired after a distinguished naval career of 26 years. U.S. Navy Medicine recently spoke with CAPT Nelson about his achievements, the state of the Medical Service Corps, and his plans for the future.*

**USNM: One of the major themes during your tenure as Director of the Medical Service Corps has been pride and professionalism. How has this concept fared?**

**CAPT Nelson:** It's difficult to measure these things, but I feel from the indications I see that we have a very good spirit of pride and professionalism. Frankly, there has been this spirit in our Corps for many years. What I do notice is a renewed awareness of our sense of family. Let me give you an example. On the occasion of the historic announcement of the commodore selectee for the Corps, a few officers got together and planned an informal dinner for MSC captains in the immediate Washington area. Well, before we knew it we had at the dinner all but nine captains who were on active duty worldwide. In their case either the distance was too great or circumstances of their duty precluded them from attending, but they were all on record as wanting to attend. All professional specialties were represented. Some participants had never met one another; others had been long-time colleagues. Some had not seen each other since Officer Candidate School. The feeling expressed was that the occasion was one of the greatest moments any of them had ever experienced in their careers. I think this illustrates the spirit of community in our Corps.

**On many of my own assignments I have become acquainted with MSC officers in the smaller specialist communities. In almost all instances I have been very impressed, especially with the junior officers.**

Many of the small specialist communities have genealogies. Who studied under whom? You see the flow of influence and of leadership qualities from senior to junior officers. The entomologists, the physical therapists among others, have tremendous competence. The aviation psychology community has been a very tightly knit group. Like the entomologists, they work in places that have traditionally been obscure to the Medical Department. To the line, however, they have been front and center. These officers, especially the junior ones, have been a great inspiration to me.

**How tough is it these days to become an MSC officer?**

We get about five applicants for every opening we have. Our procurement sources are wide-ranging. Some of the Nation's great institutions are sending applicants to us. We recently had the top student in health care administration at one of the fine universities apply and be accepted for active duty. With that quality of input at the entry stage and with applicants from different military backgrounds, things are going very well for us.

**Are there many officers in the Corps with prior military service?**

I think most people would be very surprised. About half our Corps have prior military experience. They're not all enlisted and not all Hospital Corps among the enlisted. There are many former officers from the Marine



*"My job has been to make the ultimate decisions on recommendations made to me by my staff."*

Corps, the Navy, even from the Army and Air Force.

**Have you found it difficult to manage a corps with such a diversity of professions?**

It hasn't always been easy, but I'm a great believer in participation in affairs of management. My job has been to make the ultimate decisions on recommendations made to me by my staff. When I was first appointed, I recommended to VADM Arentzen the appointment of two deputy directors with captain billets for them. These would direct the two essential parts of the MSC community. About half the Corps are health care administrators, whose jobs are rather

different from those who are in the clinical and science professions.

I have also relied upon the specialty advisor concept. We now have over 30 specialty advisors that coordinate the affairs and make recommendations pertaining to professional standards, functions, and practice for their specialty to their corresponding deputies. We therefore have reporting to the two deputies a cadre of respected advisors for subspecialty areas in health care administration, finance, supply, patient services, facilities management, and logistics, just to name a few.

In the clinical professions and sciences we have advisors in optometry, pharmacy, clinical psychology, and microbiology.

I also have initiated institutional advisors, senior officers who represent

programs peculiar to MSC deployment. This would include an institutional advisor for the Marine Corps and one for the fleet.

In answer to your question, the span of control over the Corps would be too great were I to do it alone. The system has worked well only because of the quality of the people I have working for me.

**What has been your greatest success as Chief of the Corps?**

I have had the greatest amount of pride, I think, in the spirit I feel prevails in the Corps. I know there will always be disenchantment, frustration, some antagonism, and different points of view—that's to be expected. However, I feel we have a great element of teamwork and sense of purpose. I can honestly say that never

before has the awareness and the motivation for readiness and preparedness been what it is today in the Medical Department. Our MSC officers are serving in the clinics and with the line to support that readiness. I'm not sure I can measure that in terms of a personal success but I do know that I have been proud to have served at this time.

**What will be your successor's biggest challenge?**

He will, of course, have major responsibility on the Surgeon General's staff as director of contingency planning and logistics support. That's really the major challenge for the Medical Department.

**What are your plans for retirement?**

I would really like to teach and be involved in academic administration. But I feel the time isn't right for my background. I have been offered and accepted an administrative post at the headquarters of the American Psychological Association here in Washington. We have more than 50,000 members, over half of whom are in professional specialties concerning clinical care and counseling. I will be working in the program accreditation area, responsible for the accreditation of all clinical, counseling, and educational psychology programs throughout the country. This will be a new challenge, one with some elements that are similar to those I've experienced in the Navy. I'm excited and looking forward to it.

I'll never be far from the Navy. I have a full set of khakis and whites. I'm certainly ready for any uniform the occasion may require. —JKH



*"I feel we have a great element of teamwork and sense of purpose."*



# ... Commodore Louis E. Angelo Takes the Helm

As I assume the position of Director of the Medical Service Corps, and on behalf of all Medical Service Corps officers, I extend our heartfelt thanks to CAPT and Mrs. Paul Nelson for their many years of dedicated and loyal service to our Corps. We wish them "fair winds and following seas" in their much earned retirement and second career. We look forward to a continued active and warm association with them in the years ahead.

Each Chief of the Corps, upon retiring, has left the Corps a better institution—having built upon the foundation and around the framework they inherited. During CAPT Nelson's tour as Chief, strength levels were adjusted to reflect our increasingly complex responsibilities. His career development plan perpetuates the elements of professionalism, talent, and diversification which are so critical to our Corps.

The Medical Service Corps not only is handling its many responsibilities of today in an outstanding manner but is well prepared to meet the challenges certain to face us in our future. Thanks to CAPT Nelson's leadership, we remain a dynamic and viable part of a "great Navy and Marine Corps team on the move."

The attainment of flag rank for the Corps in our 35th Anniversary year marks the achievement of a long-awaited milestone. I am extremely proud to have been selected as the first flag officer of the Corps; I am also

humbled by my selection. We all know that nothing of significance is accomplished in an organization without the help of many. I think this axiom was best expressed by the gentleman who said: "When I get to believing that I am all-important to the accomplishments of my organization, I go and look at a stonecutter hammering away at his rock, perhaps a hundred times without as much as a crack showing in it. Yet, at the hundred and first blow it will split in two, and I know it was not that blow that did it, but all that had gone before."

Many people contributed to the "splitting of our rock." Certainly our present and past Surgeons General were driving forces in this endeavor. But, more importantly, it was you, the officers of the Corps: active, Reserve, and retired. Over the years, your professionalism, dedication, enthusiasm, and professional achievement produced one of the highest standards of excellence enjoyed amongst the health professions. You MSC officers of yesterday and today have earned *your* star.

The Corps did indeed earn its flag. And I pledge to each of you, active, Reserve, and retired, that I will do my best to do it honor. I enthusiastically look forward to working for you and with you while we take our turn at the rock, continuing to build upon a firm foundation so that those who follow us can enjoy the fruits of our labors as we are enjoying the achievements of the labor of those who preceded us.

L.E. Angelo  
Commodore, MSC, USN



*Commodore Angelo*

Photo by HM2 Charles P. Runyon

# Challenges and Rewards of Serving With the FMF

CDR Robert R. Cote, MSC, USN

Orders for assignment to a Marine unit frequently results in a quickening of the pulse rate of young MSC officers. Unfortunately, this increased heart rate does not come from joyful anticipation but rather from the uncertainty of what the future holds. Many junior officers have misconceptions of what this duty is all about. Many lack understanding or simply information. I contend that there is little to fear, for these orders offer a unique opportunity to meet new challenges.

The mission of the Navy Medical Department includes providing the resources to support a health care delivery system for the Marine Corps during war and peace. We must not forget that as health care administrators and allied scientists our role goes beyond that of our civilian contemporaries. We must be trained and ready to respond and perform all over the world—aboard ship, ashore, and in some of the most remote and threatening places on earth. In addition to medical centers, hospitals, clinics, and sea-based medical facilities, many of our billets are in support of the Fleet Marine Force (FMF) and other Marine units. To what extent do health care administrators look forward to such operational assignments?

Many officers, unfortunately, are reluctant to request a tour of duty in

an operational billet. Some feel that serving with the FMF will not enhance their careers. Orders for duty with these units is an indication that their performance has not been satisfactory, and that they are being eased out of their hospitals or clinics.

Even when these officers have received good fitness reports, they feel their forthcoming tour of duty will adversely affect their promotion opportunities, and that they will not be competitive with their peers for promotion to commander or captain.

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**How many of us have ever been in charge of an armory stocked with enough rifles, pistols, grenade launchers, machineguns, and other assorted weapons to outfit a 1,000-man army?**

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Looking at this concern from another viewpoint, our careers as MSC officers should be evaluated not only in terms of our professional accomplishments in a hospital or clinic, but also in terms of how effectively we support our operational commitments. BUMED is devoting a great deal of time and effort in better preparing our Corps to serve with Marine units. Such initiatives include

attendance of officers at chemical and biological warfare defense courses, short orientation courses for new officers, FMF duty preparation courses, and career officer development courses through attendance at service schools (Amphibious Warfare School and Command and Staff College).

Current career planning guidelines emphasize continuous familiarization with combat operations, Medical Department support roles, and the officer's wartime role. These guidelines include having us serve with Marine Corps line, operations, support activities, or headquarters units. It should be noted that there is a proposed career pattern for those officers desiring to pursue an operational medicine path.

A misconception exists that a tour of duty in the FMF is not professionally rewarding. Junior officers, especially, worry about the lack of opportunity to practice the management and leadership skills they have acquired in medical centers, hospitals, and clinics. They express some concern over the loss of professional and social contact with their contemporaries. There is a fear that their entire exposure during their 2- or 3-year tour will be solely with Marine personnel. In fact, most billets are located near naval regional medical centers, allowing for ongoing professional and social interaction with peers. Part-time training, seminars, and attendance at professional workshops are available to help the officer maintain his technical competence.

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CDR Cote is assigned to the Concepts and Doctrine Branch, Development Center, MCDEC Quantico, VA 22134.



Personnel selected for assignment to Marine units should be aware that the number of billets available is not large. They are important billets, however, and those officers assigned are proven performers, capable of handling more responsibility. What is to be gained by requesting a tour of duty with the Marines? Challenge, rewards, and an opportunity to evaluate your career pattern.

An assignment with the Marines should be viewed as an opportunity to contribute and to learn. Don't judge the job by its title or location. Many of these billets have much to offer in the way of opportunity, personal and professional awareness, and growth potential. The demands associated with FMF duty are many and vary considerably from those found in a hospital or clinic. Imagine being tasked with taking a surgical hospital the size of Bethesda (550 beds), boxing it, transporting it across an ocean, unloading it, erecting it, providing surgical care, then repeating the entire process again and again. This, I maintain, is a challenge second to none.

Duty with the Marines offers opportunities not otherwise available to health care administrators and allied scientists. How many of us have ever been in charge of an armory stocked with enough rifles, pistols, grenade launchers, machineguns, and other assorted weapons to outfit a 1,000-man army? How many of us have faced the problems associated with loading a 540-bed surgical hospital on a ship with no wasted space and then identifying components as they are unloaded? Fiscal and supply officers serving with the medical logistics company of the supply battalion must anticipate the requirements of supplying an entire Marine Amphibious Force (up to 50,000 men) with medical supplies and equipment for up to 60 days. This task is seldom easy here in the United States, much less across an ocean in a combat zone.

Health care administrators can anticipate a wide variety of assign-

ments with the Marine Corps. The medical battalion, a 540-bed surgical hospital, has billet assignments for approximately 30 officers. Other assignments exist in the dental battalion, medical logistics company, Marine division, air wing, force service support group, Fleet Marine Force Atlantic and Pacific, Marine Corps Development and Education Command, Field Medical Service Schools, and Headquarters, Marine Corps.

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**The challenges offered the executive officer of a medical company provide lieutenants with the management and leadership responsibilities currently experienced by more senior officers at our shore facilities.**

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The nature of providing surgical support in combat requires a mobile functional health care delivery system that is capable of keeping up with infantry units it supports in combat. An officer assigned as the commanding officer of a medical company (a 60-bed surgical facility) must concern himself with a variety of problems. He must position his unit properly in relation to the combat troops he supports, and insure that he has adequate communications for medical evacuation procedures, whole blood requests, and other command and control needs. He must be continually aware of the status of his patient census, triage, as well as a variety of other tasks most of us never consider. The challenge of learning and getting used to "Marine matters"—how to erect a tent, cooking and eating combat rations, pistol qualifications,

gas mask training, and other similar exercises makes this duty more interesting. Preparing for war is a physically demanding occupation. It should come as no surprise that physical fitness training is a regular part of the daily routine in Marine units.

The rewards to be derived from an assignment in an operational setting are real, measurable, and serve an officer well throughout his many future assignments with the Navy Medical Department. Personnel are offered a degree of authority and responsibility seldom available in other types of duty. For example, the challenges offered the executive officer of a medical company provide lieutenants with the management and leadership responsibilities currently experienced by more senior officers at our shore facilities.

This same high degree of authority and responsibility is found in other Marine Corps assignments. The commanding officers of the medical battalion and the Field Medical Service Schools also shoulder great responsibility. The wartime strength of a medical battalion is 341 Marines and 759 Navy personnel, quite a large and complex command. The Field Medical Service School is responsible for training all hospital corpsmen and dental technicians who serve with the Marines. That medical units within the FMF are not staffed at their wartime strength allows junior officers to fill billets and perform jobs that are normally available only to more senior officers. The health care administrators assigned duty as a company commander with Marine units also bear the responsibility of administering the Navy judicial system. Regardless of rank, they maintain Article 15 and Uniform Code of Military Justice authority over the personnel assigned to their unit.

The degree of accomplishment and success achieved is visible and measurable. The Marines have an excellent system to monitor their read-



iness to perform in combat. One of the benefits of this evaluation system is the ability of a commander and his unit to measure progress and compare like units. Unlike the vague measure of mission readiness left by some inspection processes, the Marine Corps Commanding General and Inspector General inspections, as well as many other readiness inspections conducted throughout the year, reveal the unit's readiness in minute detail.

Another benefit that results from this challenging duty is the refinement of the officer's management and leadership skills. Those who accept the challenge and excel are rewarded with progressively more responsible assignments within the Navy Medical Department. Selection opportunity for promotion to commander and captain for those personnel who have successfully served repeated tours of

duty with the Marines is good. Officers, eligible for promotion, who are serving or have recently served repeat tours with the Marine Corps, are being promoted to higher rank.

Other benefits worth considering include the opportunity for some unusual leave and liberty. As a result of operational and training commitments you may have the opportunity to ski in Norway, swim in the Mediterranean or the Caribbean, or go on a shopping spree in Hong Kong. These and other diversions are available during usually short deployments of medical detachments.

Operational duty with Marine units serves well those individuals who attitudes are motivated toward a naval career and have high aspirations for professional development. As in any endeavor, a high level of commitment is required. Because about 90 percent

of all billets in support of the Marine Corps are for lieutenants and below, officers should apply for this duty early in their careers. Early assignment will allow the junior officer to make better informed decisions regarding his future career path. Senior officers and other officers with previous operational assignments have a duty to counsel and help their juniors regarding this career choice.

If I have succeeded in sparking a further interest in this subject and you are interested in learning more about the role of our Corps in providing health care to combat units, I suggest reading a publication entitled *Medical and Dental Support (Fleet Marine Force Manual, FMFM 4-5)* available through normal supply channels. This manual covers, in detail, the many facets involved in providing medical support to Marine units. □

## Obstetrics and Gynecology Meeting

The 31st Annual Armed Forces Seminar on Obstetrics and Gynecology and the 21st Annual Meeting of the Armed Forces District of the American College of Obstetricians and Gynecologists will be held 3-7 Oct 1982 at the Red Lion Inn, Jantzen Beach, Portland, OR.

Postgraduate courses for physicians are planned in endoscopy, high-risk obstetrics, ob-gyn infections, and premalignant lesions of the female tract. Postgraduate courses for nurses are planned in adolescent gynecology, prenatal nursing, nursing oncology and pathology, women in the military, stress, and abuse and neglect.

Special guest lecturer will be Dr. Michael R. Harrison, who will speak on "Treatment of the Unborn: The Fetus Becomes a Patient."

For further information or addition to the mailing list, contact LTCOL Timothy L. Sorrells, Program Chairman, AFD-ACOG '82, David Grant USAF Medical Center, Travis AFB, CA 94535. Telephone: Autovon 837-3328, Commercial (707) 438-3328.

# Orolabial Herpetic Infections

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Localized **Herpesvirus hominis** type 1 (HVH-1) infections are a problem of some significance. These conditions are ubiquitous, affecting 80 to 90 percent of the population, with 40 percent experiencing recurrent symptoms as a result of the latent virus being reactivated and mobilized from the sensory ganglia. Localized recurrences via the perineural sheet may be brought on by a number of different stimuli, such as ultraviolet light, mechanical trauma, pyrexia, emotional stress, and dietary factors.

## Diagnosis

**Primary herpetic gingivostomatitis** is the most common form of primary invasion by HVH-1. After an incubation period of 4 to 5 days, the patient complains of malaise, fever, irritability, headache, and lymphadenopathy. Within a day or two there is widespread inflammation of the marginal and attached gingivae (Figure 1) accompanied by numerous small vesicles that may develop anywhere on the oral mucosa. The symptoms begin to subside at about the sixth day of fever; the oral lesions and lymphadenopathy resolve in 10 to 14 days.

**Recurrent intraoral herpes** is characterized by single or small



FIGURE 1. Primary herpetic gingivostomatitis

clusters of vesicles that rapidly break down into ulcers. These lesions occur on the keratinized mucosa of the hard palate (Figure 2) and the gingivae and at times may be associated with recurrent herpes labialis.

**Recurrent herpes labialis** is the most common form of recurrent HVH-1 infection (Figure 3). Local symptoms are not accompanied by systemic illness. The clinical course is marked by a prodromal period of hyperesthesia or altered sensation, erythema, and edema at the site of involvement.

The prodromata are followed by the eruption of clusters of vesicles that coalesce and crust. The lesions resolve in 7 to 14 days.

**Eczema herpeticum**, or disseminated HVH-1 infection, has been described in children, immunologically compromised patients, and patients with pre-existing active dermatitis. The condition may be secondary to primary herpetic gingivostomatitis, recurrent herpes labialis, or a history of physical contact with a person who has active

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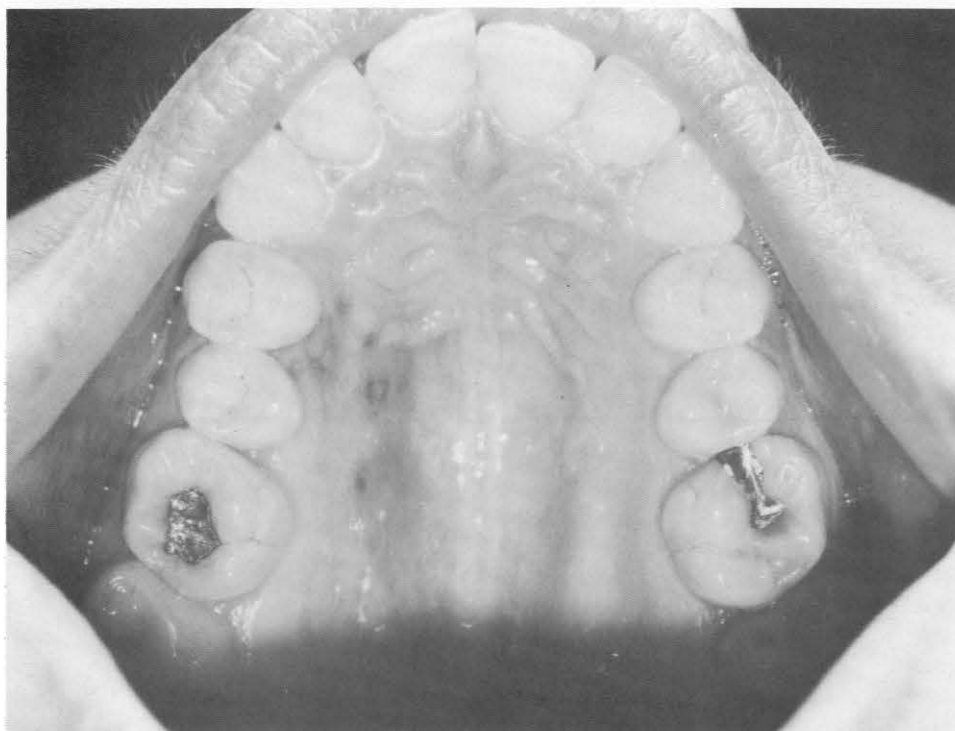


FIGURE 2. Recurrent intraoral herpes



FIGURE 3. Recurrent herpes labialis

recurrent herpes labialis. The disease occurs most frequently on the skin of the upper trunk, neck and face, and on the scalp (Figure 4). Clinical signs and symptoms include the sudden onset of diffuse vesiculation, mild-to-severe malaise, pyrexia, and generalized lymphadenopathy. The lesions usually last 2 to 3 weeks. Recovery is gradual and may be complicated by secondary infection that prevents crusting and primary healing.

**Herpes digitalis** is of particular interest to dental and medical personnel. It is a type of primary HHV-1 infection that may involve one or several digits (Figure 5). The patient usually presents with extremely painful fingers and vesicles that initially contain a clear fluid. Local adenitis and marked constitutional disturbances are also noted.

## Treatment

**Analgesics and antipyretics.** Aspirin or acetaminophen may be appropriate for the management of elevated temperature. The standard dosage of aspirin for adults is 325 to 650 mg q.i.d.; however, the analgesic effect increases with a maximum single dose of 1,300 mg but not to exceed 3,900 mg in 24 hours. Acetaminophen has become an accepted alternative to aspirin, and at times it may be the drug of choice. The standard dosage for adults is 325 to 650 mg q.i.d., but a safe ceiling dose has not been established. The anti-inflammatory analgesic ibuprofen, 600 mg q.i.d., or zomepirac sodium, 100 mg q.i.d., may be a valuable adjunct for the systemic management of mild-to-moderately severe pain.

**Topical anesthetics.** A topical application of lidocaine hydrochloride viscous, 2 percent, before each meal may be prescribed to lessen pain during eating. The agent spreads easily because of its high viscosity and low surface tension, and it adheres well to the oral mucosa. Care should be taken to prevent possible aspiration



of food because the agent may interfere with the pharyngeal phase of swallowing. Elixir of diphenhydramine hydrochloride, 12.5 mg/5 ml, a potent antihistamine, may also be an appropriate topical anesthetic agent. Side effects and adverse reactions are not expected when the drug is used topically.

**Rx**

**Lidocaine hydrochloride viscous, 2 percent**

**Disp: 100 (450) ml bottle**

**Sig: Rinse with one tablespoonful before each meal, (full strength or diluted to one-third or one-half strength)**

**Rx**

**Diphenhydramine hydrochloride elixir, 12.5 mg/5 ml**

**Disp: 4 oz bottle**

**Sig: Rinse with one tablespoonful before each meal**

**Dietary supplements.** Replacement therapy should include forced fluids and high-concentration protein, vitamin, and mineral supplements.

**Antibiotics** may be indicated for the treatment of secondary infections and then in association with a topical antimycotic agent because candidiasis is a predictable sequela in debilitated patients.

**Idoxuridine.** The eyes present a unique site for idoxuridine therapy because the superficial corneal cells are readily exposed to effective concentrations. Applied as a 0.1 percent solution or 0.5 percent ointment, idoxuridine is the accepted therapeutic agent for the treatment of herpetic keratoconjunctivitis. These concentrations, however, are of questionable value in the treatment of orolabial infections, which require greater tissue penetration.<sup>(1,2)</sup> Furthermore, some strains of HVH-1 become resistant to the action of idoxuridine, which is also a myelosuppressive, radiosensitizing, and potentially oncogenic and mutagenic compound.<sup>(3-5)</sup>



FIGURE 4. *Eczema herpeticum*



FIGURE 5. *Herpes digitalis*

It has been suggested that idoxuridine dissolved in dimethyl sulphoxide (DMSO), which in itself appears to have antiviral activity, may have enhanced tissue penetration.(6) However, DMSO may on repeated use induce an allergic reaction and increase the risk of mutagenic changes.(7)

A more reliable modality to increase the penetrability of idoxuridine is based on the principles of iontophoresis. A pledget of cotton placed at the end of the active electrode is impregnated with a 0.1 percent solution of refrigerated idoxuridine and placed over the lesion. The current is adjusted to the patient's threshold and the treatment is maintained for 10 minutes. Clinical evidence suggests that patients experience immediate relief of symptoms and healing is significantly accelerated.(8,9)

**Vidarabine** is a purine nucleoside related to idoxuridine. In double-blind randomized trials, it has been shown to be as effective as idoxuridine in the treatment of herpetic keratoconjunctivitis.(10,11) Vidarabine has also been reported to be effective in patients unresponsive or hypersensitive to idoxuridine.(12,13) Applied topically in a clinical trial during the prodromal stage of recurrent herpes labialis, a 3 percent ointment of vidarabine demonstrated a capacity to reduce the size of lesions.(14) However, there was no significant difference between the effects of vidarabine and a placebo on duration of lesions or frequency of recurrence. Vidarabine, like idoxuridine, is potentially oncogenic and mutagenic in animals, and its cutaneous use is not recommended.

**Adenine arabinoside 5'-monophosphate (ara-AMP)**, a derivative of vidarabine that is more water soluble than its parent compound, has antiviral, pharmacologic, and toxicologic properties similar to those of vidarabine. However, despite ara-AMP's activity against HVH-I in tissue cultures and in some laboratory

animals, topical application of a 10 percent ointment four times a day for 5 days was found to be ineffective in the treatment of recurrent herpes labialis.(15) Intramuscular injections of ara-AMP, 1.5 to 2.0 mg/kg given for 9 to 12 days in an alternate-day regimen were reported to initiate healing immediately and to reduce the frequency of recurrence.(16)

**9-2-Hydroxyethoxymethyl quanine** is a nucleoside analogue metabolized to acyclovir triphosphate lacking a particular hydroxyl group essential for viral replication.(17) Acyclovir therapy, topical and systemic, showed significant therapeutic efficacy in the management of HVH infections in hairless mice.(18) Although it does not appear to eliminate latent infection, it can provide effective prophylaxis against reactivated mucocutaneous infections in immunosuppressed patients.(19-21) These encouraging results merit further investigation to clearly establish both the safety and the effectiveness of this agent for the treatment of orofacial herpetic infections.

**Water-soluble bioflavonoid ascorbic acid complex** presents an antipodal approach to antiviral chemotherapy.(22) The complex is directed primarily at supporting cell physiology and function in the host cell by preserving cellular integrity. The complex has been observed to shorten the duration of pain and reduce vesiculation and disruption of the vesicular membrane. The therapeutic regimen is most effective when instituted in the early prodromal stage of the disease.

#### **Rx**

**Water-soluble bioflavonoids, 200 mg, with ascorbic acid, 200 mg**

**Disp: 100 tablets**

**Sig: Take one table three times a day for 5 days**

**Lysine hydrochloride** is an HVH-I antagonist when added to culture media.(23) In one clinical trial it has been demonstrated to have no effect

on the rate of healing in recurrent herpes labialis.(24) The same investigators further evaluated the effect of prophylactic lysine, 1,000 mg per day for 12 weeks, and concluded that although it has no significant effect on the healing of existing lesions, it does appear to prevent recurrence during therapy.(25) Lysine hydrochloride is generally recognized as safe for over-the-counter use in a dosage of up to 3,000 mg daily, but data are insufficient to demonstrate its effectiveness in treating herpetic infections.(26)

**Zinc sulfate**, at least in vitro, has been shown to selectively and irreversibly inhibit HVH-I DNA synthesis.(27,28) In a clinical trial, treatment with low concentrations of the solution prevented relapses of recurrent mucocutaneous herpetic infections during a 16 to 23 month observation period.(29) Severe irritation and dryness of the skin and mucous membranes and considerable emetic reflex noted with higher concentrations (0.2 to 1.0 percent) were not observed with 0.01 to 0.05 percent solutions. It has been suggested that for the treatment of cutaneous lesions a gauze compress soaked in lukewarm zinc sulfate, 0.25 to 0.050 percent, be placed over the infected area for 10 minutes. Intraoral lesions may be treated with mouth rinses or zinc sulfate solution, 0.010 to 0.025 percent, for 1 to 3 minutes. These regimens are to be repeated daily until the lesions heal.

**Other agents**, initially shown to be effective antiviral compounds—ether,(30,31) chloroform,(32) photodynamic inactivation,(33) and levamisole(34-35)—were subsequently discredited in controlled studies. High-dose human leukocyte interferon appears to be effective in limiting cutaneous dissemination and visceral complications of early localized herpes zoster infections in immunologically compromised patients.(36,37) However, present demand for interferon is far greater than its availability. It follows, therefore, that only

elegantly designed large-scale investigations should be encouraged.

It has been suggested that 2-deoxy-D-glucose, an inhibitor of glycosylation of viral-envelope proteins, may be effective in the topical treatment of genital herpes.<sup>(38)</sup> However, further confirmation in carefully controlled large-scale studies is needed before it can be recommended for treatment of orolabial herpetic infections.

The results of a preliminary trial using cimetidine warrant an inquiry into the potential role of this agent in the treatment of herpetic infections.<sup>(39)</sup> A 2-day regimen of cimetidine, 400 mg t.i.d. with meals, followed by a 5-day regimen, 200 mg t.i.d. with meals and 400 mg at bedtime, produced dramatic relief of pain and rapid disappearance of the eruption.

## Conclusion

Herpetic infections are usually self-limiting. Their treatment should be primarily supportive and directed toward controlling the signs and symptoms of the particular condition under consideration. Successful management consists of controlling pyrexia, dehydration, and pain; preventing secondary infections; and close monitoring for evidence of visceral viremia.

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# Spontaneous Abortion and Emotional Conflict

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CAPT Jesse O. Cavenar, Jr., MC, USNR

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In the past 5 years there have been many articles in the psychiatric literature concerning therapeutic abortion. Most of these contributions have questioned whether or not there are, at times, emotional sequelae to the procedure. One can find communication supporting the notion that there are no significant emotional sequelae, and others suggesting that approximately one-half the women undergoing the procedure experience significant guilt or even more serious emotional problems. Many studies have focused on large groups of women who obtained therapeutic abortion, and few have studied the individual patient in depth.

We have attempted to study individuals who present with emotional difficulty after therapeutic abortion in an effort to understand the individual's dynamics and to

determine the factors which might select out those women who would respond either favorably or poorly to the procedure. We have published extensively on our work with women who did experience emotional conflict following therapeutic abortion.<sup>(1-5)</sup>

In our work with women who have obtained therapeutic abortion, we have been continually impressed by the lack of attention given to the emotional status of women who have experienced spontaneous abortion. The unspoken feeling and thought appears to be that these women have had an interruption of pregnancy through no active intervention of their own and should therefore be capable of dealing with the emotional situation. While this may be true at times, at other times these women do have significant emotional conflict. The purpose of this article is to report two cases in which emotional sequelae were apparent and to offer suggestions for the management of women who spontaneously abort.

**Mrs. A** is a 35-year-old married female who works in the health care field. She presented to an outpatient clinic with a chief complaint of depression for 3 months and described a sad mood, crying spells, and a desire not to have to interact with other

people since she had experienced a spontaneous abortion at 25 weeks gestation, some 12 weeks earlier.

The mental status examination revealed a woman who was coherent, logical, and relevant. She was articulate and had meticulous personal hygiene and dress but appeared depressed and sad; decreased eye contact was noted and she cried readily. There was no evidence of psychosis, but she had obsessive thoughts of guilt regarding the aborted child. She noted that she was having experiences of hearing babies cry, and of smelling babies, and had been taking gifts to a friend's baby who was born 2 weeks prior to her miscarriage. She had begun babysitting the child for her friend and had experienced a dissociative or fugue episode during which she tried to kidnap the child. After realizing what she had nearly done, she decided to seek psychiatric assistance. Ironically, 2 weeks before coming to the clinic, Mrs. A actually found a live, abandoned baby in a garbage can at a roadside rest area.

The history revealed that she had experienced difficulty a month and a half prior to the spontaneous abortion, when she developed a urinary tract infection and had gone into labor, necessitating hospital admis-

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sion for 2 weeks. After discharge she had been at bed rest for a week, became bored, and urged her obstetrician to permit her to return to work. She had been back at work for 3 weeks when she had a sudden premature rupture of the membranes. The patient was hospitalized and labor was induced. A female child was born, and she was able to hold the child for an hour, but upon return to the nursery, the child died.

After returning home Mrs. A was angry at her husband for not helping her more during her pregnancy. She directly blamed him for the miscarriage, and this led to marked marital and sexual conflicts. She related that she and her husband had previously separated for 3 months because of communication problems in the marriage; after reconciling, she became pregnant immediately. She recalled not wanting the child initially because she felt a need to concentrate on the marriage. Moreover, her husband accused her of getting pregnant to keep him from leaving again. She had developed positive feelings about her pregnancy only weeks prior to her spontaneous abortion.

Mrs. A was felt to be a good candidate for insight-oriented psychotherapy. During the therapy, dynamically relevant issues appeared to be her anger at both herself and her husband because of the suddenness of the pregnancy after reconciliation. In addition, there was marked guilt that she had not wanted the child initially and had wished the child would go away. Clearly, the child's death had intensified this guilt. There was also an intense desire to have her child, as evidenced by the wish-fulfilling fantasy of hearing and smelling babies. The accidental finding of the abandoned baby further intensified these desires, again resulting in more conflict for Mrs. A. She continues to

make excellent progress in psychotherapy, and her prognosis is quite good.

**Mrs. B** is 30 years old and childless. She was committed to a psychiatric facility after attacking and attempting to kill her husband with a knife.

The history revealed that the couple had wanted a child for many years but had not been successful. When Mrs. B finally became pregnant, she was ebullient and euphoric, as was Mr. B. As her pregnancy progressed she expressed a desire for both she and Mr. B to visit relatives in a distant city. Due to his work schedule, Mr. B was unable to take such a trip but insisted that she do so since it meant so much to her. While visiting she developed sudden and severe hypertension and pedal edema requiring hospitalization. She developed abruptio placenta and the child was born dead.

A short time after returning home, Mrs. B began to accuse Mr. B of having caused the death of the child. She became progressively more agitated over a 3-week period, was having extreme difficulty sleeping, and began to feel that her thoughts were being broadcast for the entire world to hear. She then attacked Mr. B with a large kitchen knife, an episode that led to involuntary hospitalization.

The mental status examination revealed a patient who was overtly psychotic with a rampant thought disorder and paranoid persecutory delusions. She was felt to be experiencing a schizophrenic decompensation and was started on antipsychotic medication. She gradually improved and eventually was able to leave the hospital but did not recover her premorbid level of functioning. Her prognosis for full recovery is guarded.

Dynamically, it appeared that Mrs. B had intense ambivalence about becoming pregnant; she was aware

consciously of only the positive aspects. After the death of the child, the negative aspects of her ambivalence were more than she could tolerate, and these aspects were projected to Mr. B. As he became identified in her psychotic reasoning as a murderer, she attempted to kill him. Clearly, it was her own inner feelings about herself that she was attempting to resolve.

## Comment

Therapeutic abortion is currently a lively political, moral, ethical, and at times religious issue, and many psychiatric articles are appearing describing the possible psychiatric sequelae of the procedure. However, we must constantly be aware that women can experience emotional conflict and psychiatric illness following spontaneous abortion. In the same manner that women who have received therapeutic abortion are now being seen at major medical centers once or more after the procedure for assessment of their emotional status, it would similarly be prudent to follow women who have had spontaneous abortions. By doing so, illnesses and conflicts could be detected earlier with more rapid institution of needed treatment.

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# Cardiac Disease and the Third Decade Sailor Concept

LT Edward J. Marciniak, MSC, USNR

Cardiac disease kills more Americans each year than any other disease, including cancer. It is largely due to the frequent occurrence of cardiac disease that American men rank 21st on a worldwide list of life expectancy.<sup>(1)</sup> Thus, the death toll inflicted by cardiac disease has become a challenge not only to the Navy medical profession but to society as a whole.

Because of the severity of cardiac disease in the general population and the lack of adequate information concerning cardiac disease incidence in the Navy, this study was undertaken in order to:

- Determine the incidence rate of cardiac disease in the Navy.
- Determine how the incidence of cardiac disease may affect the enactment of a third decade sailor concept, i.e., an individual extending a service career beyond 20 years.
- Estimate the cost of cardiac hospitalization for Navy personnel from 1966 to 1977.
- Discuss the possible implications of physical fitness in relation to cardiac disease prevention in the third decade sailor.

## Characteristics of the Navy Population

Because the Navy represents a selected population from the standpoint of physical fitness, the incidence

of cardiac disease in the Navy may not reflect the rate of incidence in the general population. The Navy population differs greatly from the general population in two important factors, male/female ratio and age distribution. For example, over a 12-year span (1966-1977) the enlisted population was approximately 98.5 percent male and 1.5 percent female. The ratio in the officer population was 95.5 percent male and 4.5 percent female. These ratios do not represent the male/female ratio in the general population which is 51.2 percent female and 48.7 percent male.

In regard to age distribution, the Navy is characteristically a youthful organization. Approximately 88.5 percent of the enlisted population and 48.0 percent of the officer population were under 35 years of age\* (Table 1). In the general population, approximately 33 percent of the people were between the ages of 17 and 34 for that period.

## Methods and Materials

Information on cardiac disease incidence was obtained from hospitalization records of active duty Navy personnel admitted for cardiac disease from 1966 to 1977 and was available from the Naval Medical History Data System at the Naval Health Research Center (NHRC), San Diego, CA. The study population consisted of officer and enlisted

personnel of both sexes, divided into 10 separate age groups.

The categories of cardiac disease were:

- Acute myocardial infarction\*
- Acute forms of ischemic heart diseases
- Chronic ischemic heart disease
- Atherosclerosis of coronary arteries
- Myocardial degeneration
- Angina pectoris
- Asymptomatic ischemic heart disease

Overall incidence rates for cardiac disease are based on the number of new cardiac disease cases per 100,000 population. Other computations included cardiac disease incidence rates for specific age groups and by year of occurrence. The average number of enlisted personnel on active duty in each occupational category was determined from quarterly reports published in Navy Marine Corps Personnel Statistics.

## Incidence of Cardiac Disease in the Navy

**Age.** Enlisted personnel under 35 show low incidence rates of cardiac disease (Table 1). However, over 35 the incidence rate rises dramatically.

In the officer population the incidence rate in the 17 to 34 age group is again low. Following the trend of the enlisted population, officers over

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\*Age group populations from Navy military personnel statistics

\*NHRC Disease Category Codes, derived from ICDA-9



**TABLE 1. Average Population, Percent of Population, Number of Cardiac Disease Cases and Incidence Rate of Cardiac Disease for Enlisted and Officers**

1966-1977								
Age	Enlisted				Officers			
	Average Pop.	Average % Pop.	Average No. CD	Average IR CD	Average Pop.	Average % Pop.	Average No. CD	Average IR CD
17-19	68,502	12.95%	2.25	3.3	0	0	0	0
20-24	268,510	50.70%	7.66	2.8	4,217	8.44%	.33	7.8
25-29	77,476	14.65%	9.16	11.8	9,612	19.25%	1.00	10.4
30-34	53,727	10.16%	36.83	68.5	10,470	20.27%	2.66	25.4
35-39	40,781	7.71%	89.00	218.2	10,572	21.18%	12.50	118.2
40-44	13,752	2.60%	57.25	416.3	8,344	16.71%	21.75	260.7
45-49	4,546	0.86%	39.83	876.1	4,754	9.52%	24.91	523.9
50-54	1,066	0.20%	11.25	1,055.3	1,539	3.08%	10.16	660.2
55-59	309	0.06%	5.08	1,644.0	346	0.69%	2.66	768.8
60 >	91.5	0.017%	2.50	2,732.2	73.5	0.15%	1.16	1,578.2

*Incidence rates are based on the average number of cardiac disease cases per 100,000 population from 1966 to 1977.*

**TABLE 2. Average Population, Number of Cardiac Disease Cases and Incidence Rate of Cardiac Disease for Male and Female Enlisted and Officers**

	Enlisted			Officers			Total		
	Average Pop.	Average No. CDC	Average IRCD	Average Pop.	Average No. CDC	Average IRCD	Average Pop.	Average No. CDC	Average IRCD
Male	520,792	259.4	49.8	47,677	75.4	158	568,469	334.8	58.9
Female	7,930	1.41	17.7	2,246	1.75	78	10,176	3.16	31.0
Total	528,722	260.81	49.3	49,924	77.15	154	578,645	337.96	58.4

*Incidence rates are based on the average number of cardiac disease cases per 100,000 population from 1966 to 1977.*

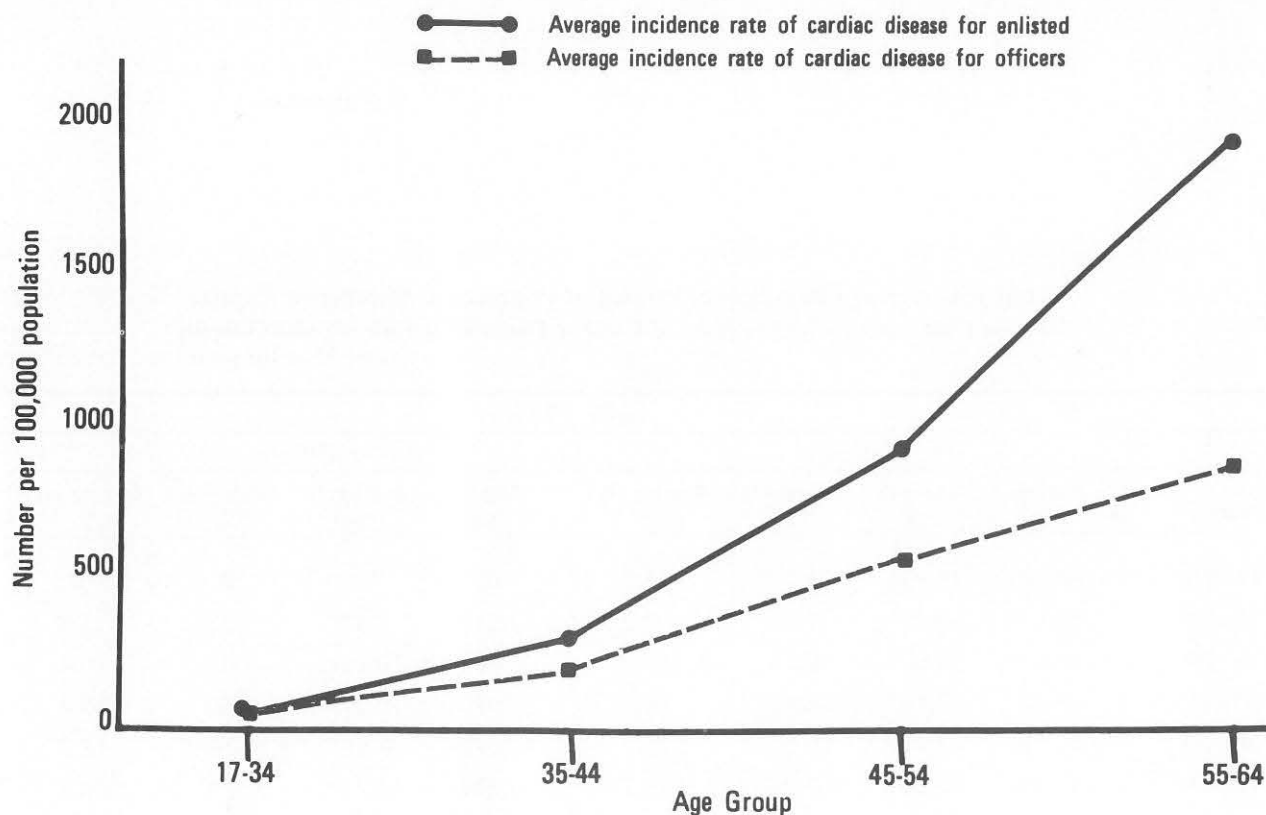


FIGURE 1. Incidence rates are based on the average number of cardiac cases per 100,000 population from 1966 to 1977.

35 show a much higher incidence for heart disease.

A comparison of enlisted and officer incidence rates for heart disease is shown in Figure 1.

**Sex.** The total Navy male population averages  $334.8 \pm *$  cases of cardiac disease per year (Table 2). The incidence of heart disease for males was found to be 58.9 cases per 100,000.

The Navy female population averages only  $3.16 \pm **$  cases of cardiac disease a year. The incidence was found to be 31.0 cases per 100,000.

Women do not greatly affect the total incidence rate of cardiac disease in the Navy (Table 2). Women comprised only 1.5 percent of the enlisted population and with an incidence rate of 31.0 cases per 100,000 accounted for only 1.14 heart disease cases per

year. Estrogen produced by premenopausal women may offer a measure of protection from cardiac disease.(2) Because this potential built-in hormonal protection from heart disease is lost during menopause, increased numbers of third decade women sailors entering menopause may create increased cardiac hospitalization costs.

### Cost of Cardiac Hospitalization

The annual cost of cardiac hospitalization in the Navy runs into the millions of dollars. Figure 5 lists the estimated total cost of cardiac hospitalization for male and female personnel. This cost estimate was derived using \$200 to \$250\* as the average hospital day cost in the Navy.

Discounting the inflation rate, the cost of cardiac hospitalization in 1966 amounted to approximately \$4.2 million (Figure 3). Hospitalization costs reached a peak in 1971 (\$7.3 million), but the post-Vietnam War trend has been toward lower costs (1977, \$2.05 million). These cost figures should be regarded as general estimates since figures do not take into account the increased costs of specialized cardiac intensive care nor the indirect expenses associated with the hospitalizations.

### Effect of Age

The extent of the heart disease problem is magnified for naval personnel over 35 years of age. The 35 to 39 age group led all others in the number of days hospitalized (68,141 days). At roughly \$200 to \$250 per day, the cost of hospitalization for this age group totals over \$15.8 million.

\*Standard deviation (male 67.34)

\*\*Standard deviation (female 1.91)

\*Daily hospitalization cost at NRM C San Diego

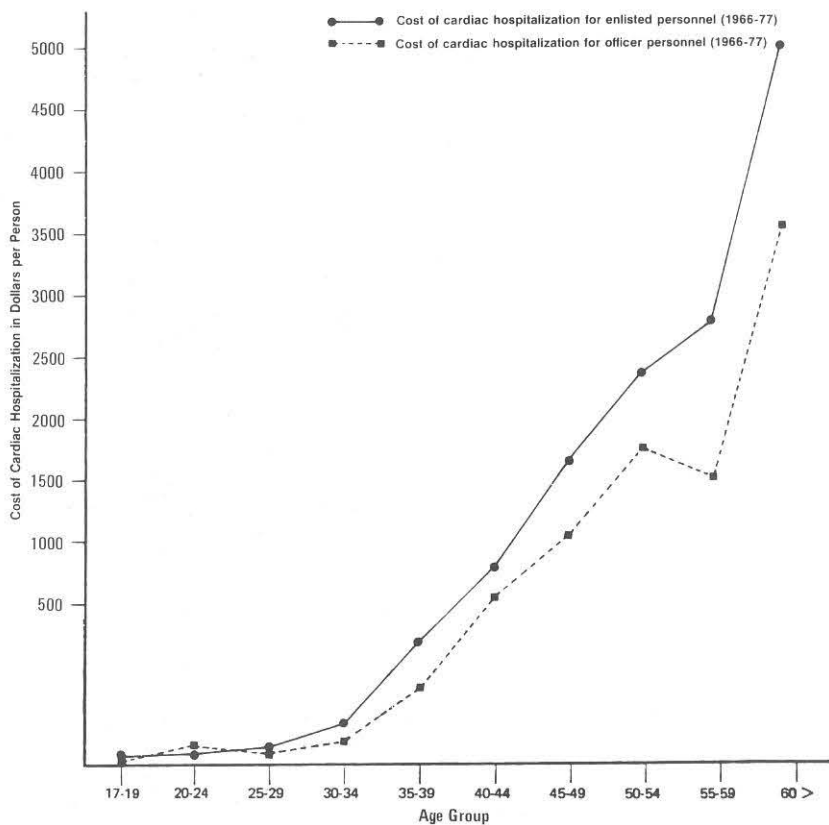


FIGURE 2. Cost of cardiac hospitalization per person, determined by dividing total cost of cardiac hospitalization for each age group by average population of that age group.

Cost of cardiac disease hospitalization for all enlisted personnel under 35 was approximately \$8.9 million.

The third decade sailor concept, by increasing the number of older sailors remaining beyond 20 years, may magnify the over 35 cardiac disease problem. At present incidence rates, an increase of only 10 percent in the over 35 sailor population would create an additional hospitalization cost of about \$130,000. This is an increase of approximately 11.8 percent over the 1977 cost estimate of \$1.1 million.

The cost of cardiac hospitalization according to age group is provided in Figure 2. The hospitalization cost per person has been shown to increase dramatically with age. This is due to the substantially higher incidence rate of cardiac disease associated with advancing age and is not directly associated with the length of cardiac hospitalization that does not consistently increase with age (Figure 4).

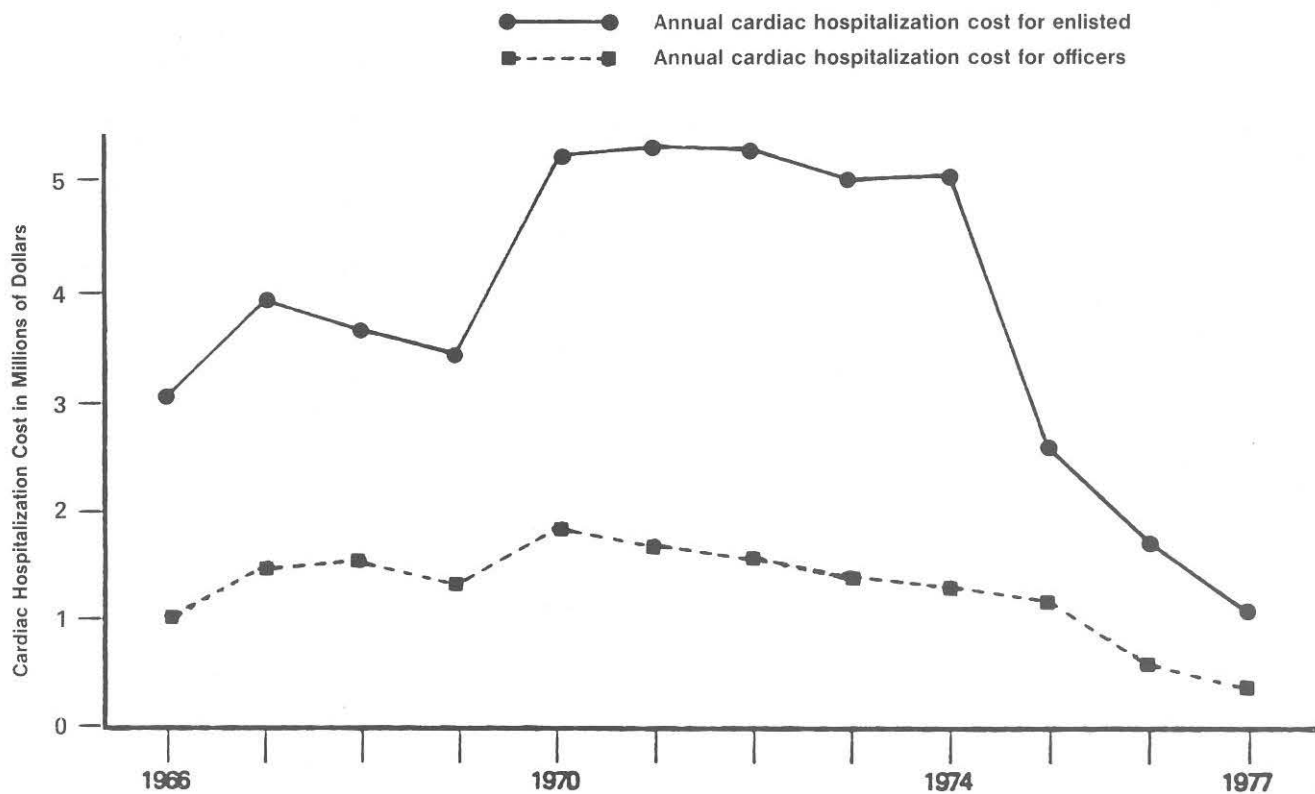


FIGURE 3



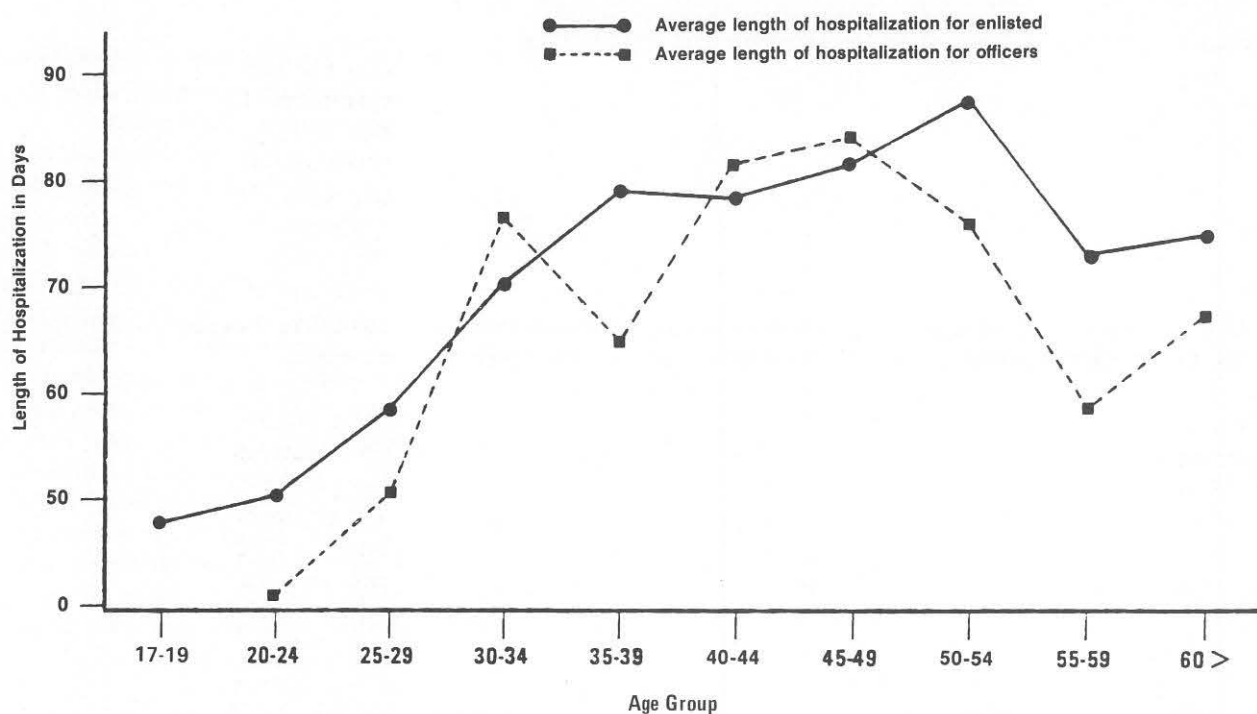


FIGURE 4. Average length of hospitalization, determined by dividing total number of days hospitalized for each age group by total number of people hospitalized of that age group.

### Enlisted vs. Officer Costs for Cardiac Hospitalization

The estimated cost of cardiac hospitalization for enlisted and officers is recorded in Figure 3. The average enlisted cardiac patient spent 69.3 days in the hospital and his cost of cardiac hospitalization was \$15.6 thousand. The average officer cardiac patient spent 66.4 days in the hospital and his cost of hospitalization was \$14.9 thousand. The length of hospitalization according to age group is listed in Figure 4.

New cardiac rehabilitation programs that get patients out of the hospital faster may be responsible for the reduction in hospitalization costs. In 1972 the average length of hospitalization for enlisted cardiac patients was 88 days. In 1977 the average length of hospitalization had fallen to 27.8 days. This is a good example of how good medical care management can save the Navy millions of dollars per year.

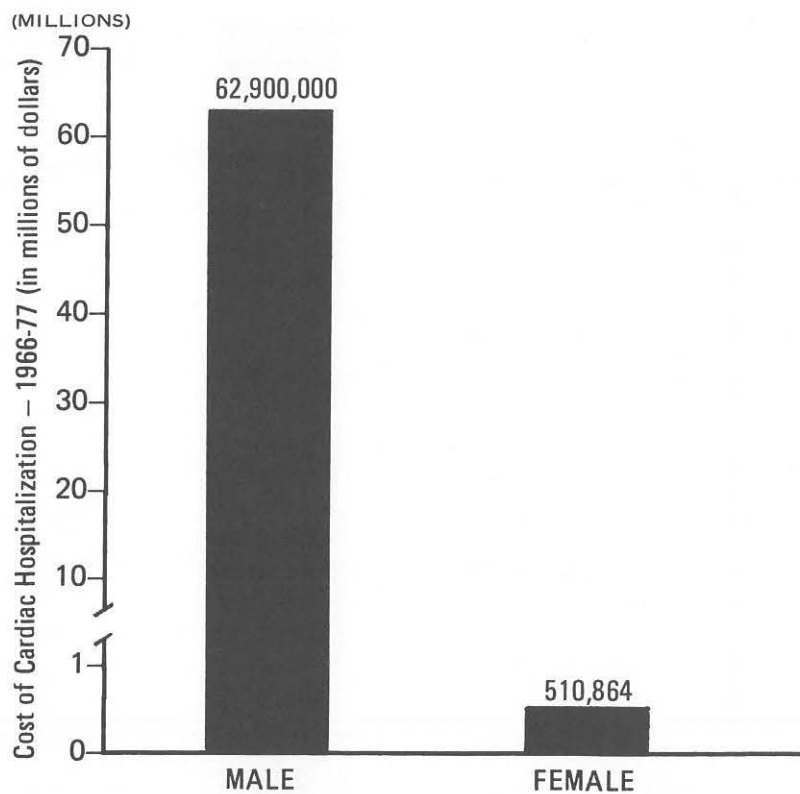


FIGURE 5

## The Third Decade Sailor

Extending normal service careers beyond 20 years has created some intriguing economic questions. Since the incidence of cardiac disease in the Navy has been found to increase with age, what would be the impact of the third decade sailor on cardiac hospitalization costs? Also, what preventive measures could be undertaken by the medical profession to lessen the cost of cardiac hospitalization created by the third decade sailor?

Assuming a sailor enters the Navy at age 18 and serves for 20 years, he would become a third decade sailor at age 38. The 35 to 39 age group has already been found to be an area of increased cardiac disease incidence (218.2 cases per 100,000, Table 1).

Creation of a third decade sailor would substantially increase the number of sailors 30 years of age and older. The over 40 enlisted population has been found to have a high incidence rate for cardiac disease (584.4 cases per 100,000). However, the average population of enlisted personnel over 40 is only 19,764 and the result is a total of only 116 cardiac cases per year.

If, through the creation of a third decade sailor, the number of sailors 40 years of age and older approached that of 30-year-old sailors (94,508), the estimated number of cardiac disease cases for the older sailors would be approximately 548 per year.

## Physical Fitness and the Impact of the Third Decade Sailor

The third decade sailor represents a tremendous resource of talent, experience, and knowledge to the Navy.

However, the extension of naval careers may create a number of problems. An older, less physically active population may contribute to an increase of cardiac disease morbidity and mortality. An increased incidence of cardiac disease among older sailors presents not only an economic problem but an operational readiness problem as well. Increased numbers of disabled sailors reduce the potential work output and put additional stress on fleet medical facilities.

In 1976 the estimated cost of lost production in industry due to cardiac disease was about \$50 billion.<sup>(3)</sup> Over 132 million workdays are lost annually in the United States due to heart disease.<sup>(4)</sup> The American Heart Association estimates a cost of \$700 million per year to replace the 200,000 men aged 45 to 65 years who die or are disabled from coronary disease.

It is clear that if the extension of naval careers becomes reality, potentially effective preventive measures, such as physical fitness conditioning and nutrition programs, will be needed to lessen the age-related risks of cardiac disease. Physical conditioning programs have been widely recommended in the medical literature as a means of reducing the risk of heart disease. One researcher<sup>(5)</sup> has shown a consistent inverse relationship between physical fitness and coronary risk factors (resting heart rate, body fat, serum triglyceride and cholesterol, systolic blood pressure).

A physical conditioning program may also have other beneficial effects related to operational readiness and job performance. Raab<sup>(6)</sup> found that a physical fitness program led to a

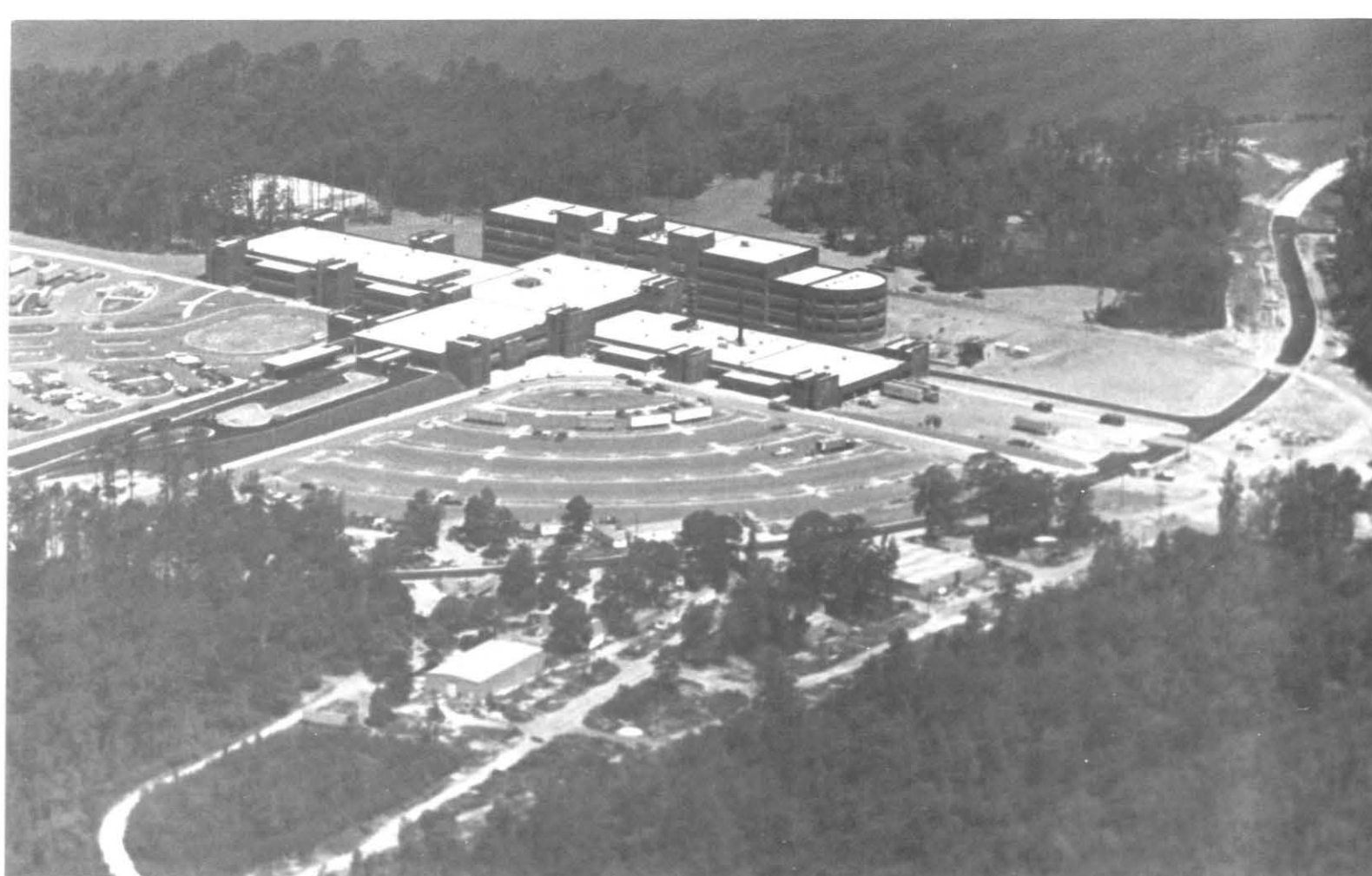
reduction of absenteeism by 68.6 percent for workers with cardiovascular symptoms. Pravosudov<sup>(7)</sup> mentions that workers taking part in physical fitness programs miss fewer days from sickness and the duration of sick leave is shorter. The report also indicates that those who are not physically active are ill five to eight times more often than those involved in the fitness program.

The Navy's only natural resource is her personnel. In a time of conservation awareness, the third decade sailor category represents a reserve of talent and experience that has yet to be fully tapped. Understanding cardiac disease and searching for ways to prevent it or reduce its prevalence among this group will help to insure that the sailor who remains on active duty beyond 20 years will remain a productive member of the Navy work force.

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*The new replacement hospital at NRMCC Camp Lejeune*

## Mast Stepping Ceremony for Camp Lejeune

CAPT John N. Rizzi, MC, USN    CDR H.E. Phillips, MSC, USN    LT D.A. Wynkoop, MSC, USN

On 21 July 1982, another milestone in the construction of the new naval regional medical center at Camp Lejeune was reached in a Mast Stepping Ceremony during which silver dollars were placed at the base of the hospital's flagpoles

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Dr. Rizzi is Commanding Officer, NRMCC Camp Lejeune, NC. CDR Phillips is Military Construction Liaison Officer of the project. LT Wynkoop is Assistant Military Construction Liaison Officer.

honoring the Chief of Naval Operations, Commandant of the Marine Corps, and Surgeon General of the Navy.

The stepping of a mast is the ancient naval custom of placing coins under the foot of a mast at the time a ship is built. This tradition dates from antiquity and derives from the old Roman custom of placing coins in the mouths of the dead to pay their way to Charon for passage across the River Styx. If the ship should ever meet with a

mishap at sea, the coins under its mast insured that the fare for all hands was paid.

Taking part in the ceremony were MAJGEN A.M. Gray, Jr., Commanding General, 2nd Marine Division, representing the Commandant of the Marine Corps; CAPT John N. Rizzi, Commanding Officer at NRMCC Camp Lejeune, representing the Chief of Naval Operations; and CDR H.E. Phillips, Medical Construction Liaison Officer, representing the

Surgeon General of the Navy. The new facility, now nearing completion, will replace the old hospital built at Hadnot Point during World War II.

The design of the facility incorporates the most modern concepts in hospital operations, including a centralized material management center based on a modular material handling and casework system that will provide daily delivery of all medical-surgical supplies and linen required to operate the hospital. Camp Lejeune is the first military medical facility ever designed specifically to use such a system, intended to enhance the command's ability to respond to the inevitable changes in health care delivery. The building also has a central computer that will monitor and control all critical systems—

security, medical gases, and energy use within the hospital complex.

For the safety of patients, staff, and visitors, the latest concepts in fire protection and detection systems will be provided. Additionally, closed circuit television surveillance equipment will monitor all sensitive areas of the complex. In the event of power failure, an emergency power distribution system on standby is designed to provide electrical service to all critical systems and equipment.

As we enter a new phase in the history of NRMCC Camp Lejeune, we look optimistically to the future and the improvement in health services available to our Navy/Marine Corps family that this facility will make possible.

The planning and design for the new hospital was accomplished by the architectural and engineering joint venture of Lockwood-Greene/Six Associates, working with BUMED and the Atlantic Division of Naval Facilities Engineering Command. On 21 March 1979, a construction contract was awarded to Cardinal Contracting Company of Dallas, TX, for \$39,339,000, with completion scheduled in late 1982 and occupancy in early 1983.

The new hospital is being built on a 162-acre site on Northeast Creek near the intersection of Stone Street and Brewster Boulevard and will contain approximately 420,000 square feet of floor space in the main hospital building, which includes the power plant and warehouse. This will be supplemented in 1983 by the construction of a Public Works support building, helo pad, and landscaping of the hospital site.

The hospital consists of a four-story nursing tower fronted by a two-story clinical and support building. The outpatient clinics

have been efficiently designed to enhance staff productivity and permit easy access by patients to clinics and supporting services alike. Most significantly, the design is intended to segregate access to and circulation within the building, while guaranteeing future expansion. The basic structure is a cast-in-place, reinforced concrete frame of zero combustibility. The exterior walls are brick, masonry, and insulated glass. The interior finishes were selected for their durability, ease of maintenance, and aesthetic value.

The hospital will provide space for 205 inpatients, expandable to 236, plus extensive general and specialty care outpatient clinics. The inpatient spaces are designed in private, semiprivate, and four-bed units with private baths, to permit the mixing of patient categories within nursing units organized by medical specialty. This design allows for the maximum use of inpatient beds at all times, while providing a pleasant and dignified setting for the patient. The hospital is of ultra-modern design and uniquely color coordinated to encourage a warm and pleasant environment. The waterfront location on Northeast Creek will make maximum use of its natural wooded setting.

The hospital will provide space for 80 health care practitioners in suites consisting of an office and one or two exam rooms, depending on specialty. The Surgical Suite consists of five operating rooms, while the Obstetrical Suite has five labor rooms and three delivery rooms. The hospital will have modern, eight-bed Intensive and Coronary Care Units as well as a Neonatal Intensive Care Unit. A new Nuclear Medicine Service and expanded Laboratory and Radiology Services will give the hospital the latest diagnostic capabilities.



*CAPT Rizzi places a silver dollar at the base of the hospital flagpole in the name of the Chief of Naval Operations.*



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